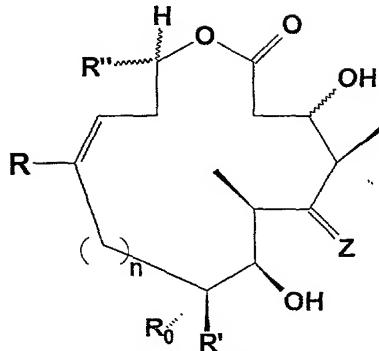


What is Claimed is:

1. 1. A compound having the structure:

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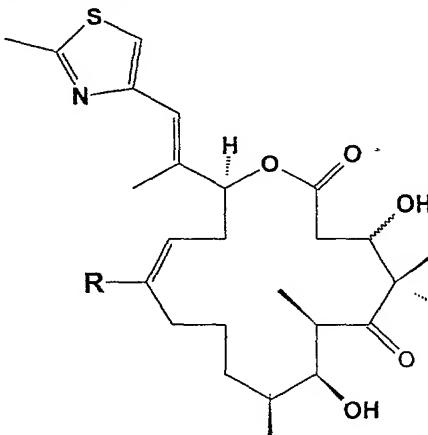
3 wherein R, R₀, and R' are independently H, linear or branched chain alkyl, optionally
4 substituted by hydroxy, alkoxy, carboxy, carboxaldehyde linear or branched alkyl or
5 cyclic acetal, fluorine, NR₁R₂, N-hydroximino, or N-alkoxyimino, wherein R₁ and R₂
6 are independently H, phenyl, benzyl, linear or branched chain alkyl; wherein R'' is -
7 CHY=CHX, or H, linear or branched chain alkyl, phenyl, 2-methyl-1,3-thiazolinyl, 2-
8 furanyl, 3-furanyl, 4-furanyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, imidazolyl, 2-methyl-1,3-
9 oxazolinyl, 3-indolyl or 6-indolyl; and wherein X is H, linear or branched chain alkyl,
10 phenyl, 2-methyl-1,3-thiazolinyl, 2-furanyl, 3-furanyl, 4-furanyl, 2-pyridyl, 3-pyridyl,
11 4-pyridyl, imidazolyl, 2-methyl-1,3-oxazolinyl, 3-indolyl or 6-indolyl; wherein Y is H
12 or linear or branched chain alkyl; wherein Z is O, N(OR₃) or N-NR₄R₅, wherein R₃, R₄
13 and R₅ are independently H or a linear or branched alkyl; and wherein n is 0, 1, 2, or
14 3.

1 2. 2. The compound of claim 1 having the structure:

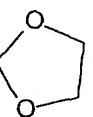
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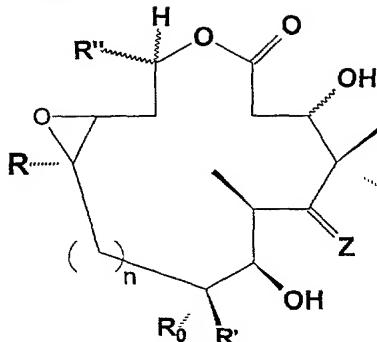


wherein R is H, methyl, ethyl, n-propyl, n-butyl, n-hexyl, or



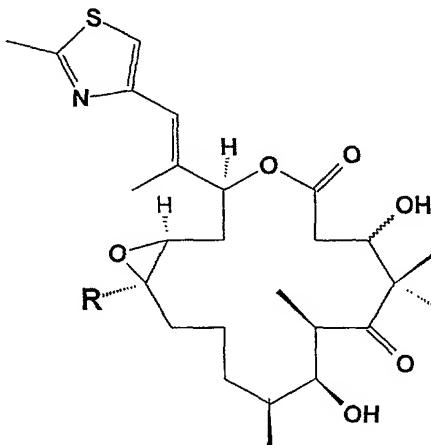
6 (CH₂)₃-OH.

1 3. A compound having the structure:



4 wherein R, R₀, and R' are independently H, linear or branched chain alkyl, optionally
5 substituted by hydroxy, alkoxy, carboxy, carboxaldehyde linear or branched alkyl or
6 cyclic acetal, fluorine, NR₁R₂, N-hydroximino, or N-alkoxyimino, wherein R₁ and R₂
7 are independently H, phenyl, benzyl, linear or branched chain alkyl; wherein R" is -
8 CHY=CHX, or H, linear or branched chain alkyl, phenyl, 2-methyl-1,3-thiazolinyl, 2-
9 furanyl, 3-furanyl, 4-furanyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, imidazolyl, 2-methyl-1,3-
10 oxazolinyl, 3-indolyl or 6-indolyl; and wherein X is H, linear or branched chain alkyl,
11 phenyl, 2-methyl-1,3-thiazolinyl, 2-furanyl, 3-furanyl, 4-furanyl, 2-pyridyl, 3-pyridyl,
12 4-pyridyl, imidazolyl, 2-methyl-1,3-oxazolinyl, 3-indolyl or 6-indolyl; wherein Y is H
13 or linear or branched chain alkyl; wherein Z is O, N(OR₃) or N-NR₄R₅, wherein R₃, R₄
14 and R₅ are independently H or a linear or branched chain alkyl; and wherein n is 0,
15 1, 2, or 3.

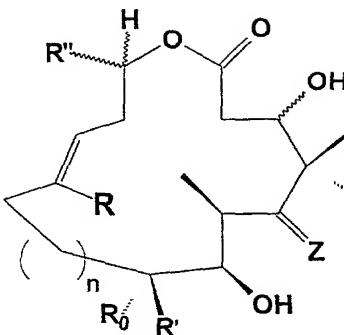
1 4. The compound of claim 3 having the structure:



3 5 wherein R is H, methyl, ethyl, n-propyl, n-butyl or n-hexyl.

1 5. A compound having the structure:

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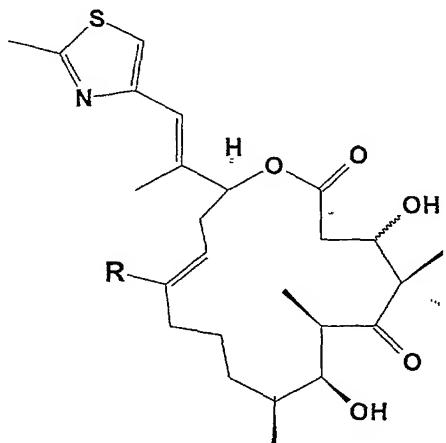


3

4 wherein R, R₀, and R' are independently H, linear or branched chain alkyl, optionally
5 substituted by hydroxy, alkoxy, carboxy, carboxaldehyde linear or branched alkyl or
6 cyclic acetal, fluorine, NR₁R₂, N-hydroximino, or N-alkoxyimino, wherein R₁ and R₂
7 are independently H, phenyl, benzyl, linear or branched chain alkyl; wherein R'' is -
8 CHY=CHX, or H, linear or branched chain alkyl, phenyl, 2-methyl-1,3-thiazolinyl, 2-
9 furanyl, 3-furanyl, 4-furanyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, imidazolyl, 2-methyl-1,3-
10 oxazolinyl, 3-indolyl or 6-indolyl; and wherein X is H, linear or branched chain alkyl,
11 phenyl, 2-methyl-1,3-thiazolinyl, 2-furanyl, 3-furanyl, 4-furanyl, 2-pyridyl, 3-pyridyl,
12 4-pyridyl, imidazolyl, 2-methyl-1,3-oxazolinyl, 3-indolyl or 6-indolyl; wherein Y is H
13 or linear or branched chain alkyl; wherein Z is O, N(OR₃) or NNR₄R₅, wherein R₃, R₄
14 and R₅ are independently H or a linear or branched chain alkyl; and wherein n is 0,
15 1, 2, or 3.

1 6. The compound of claim 5 having the structure:

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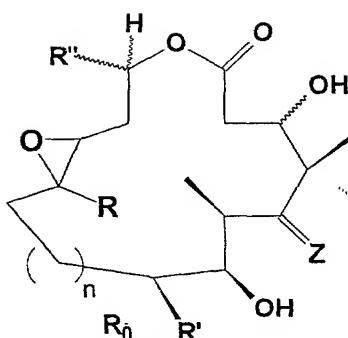


3

4 wherein R is H, methyl, ethyl, n-propyl, n-butyl, n-hexyl or hydroxypropyl.

1 7. A compound having the structure:

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wherein R, R₀, and R' are independently H, linear or branched chain alkyl, optionally substituted by hydroxy, alkoxy, carboxy, carboxaldehyde linear or branched alkyl or cyclic acetal, fluorine, NR₁R₂, N-hydroximino, or N-alkoxyimino, wherein R₁ and R₂ are independently H, phenyl, benzyl, linear or branched chain alkyl; wherein R'' is -CHY=CHX, or H, linear or branched chain alkyl, phenyl, 2-methyl-1,3-thiazolinyl, 2-furanyl, 3-furanyl, 4-furanyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, imidazolyl, 2-methyl-1,3-oxazolinyl, 3-indolyl or 6-indolyl; and wherein X is H, linear or branched chain alkyl, phenyl, 2-methyl-1,3-thiazolinyl, 2-furanyl, 3-furanyl, 4-furanyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, imidazolyl, 2-methyl-1,3-oxazolinyl, 3-indolyl or 6-indolyl; wherein Y is H or linear or branched chain alkyl; wherein Z is O, N(OR₃) or N-NR₄R₅, wherein R₃, R₄ and R₅ are independently H or a linear or branched chain alkyl or alkoxy; and wherein n is 0, 1, 2, or 3.

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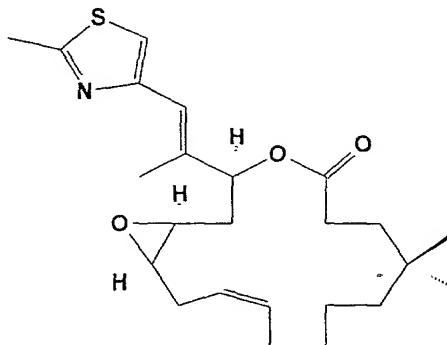
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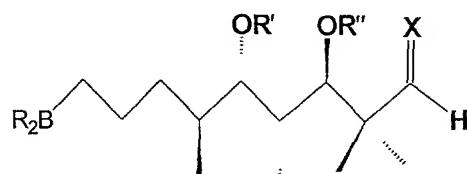
8. A compound having the structure:



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9. A compound having the structure:



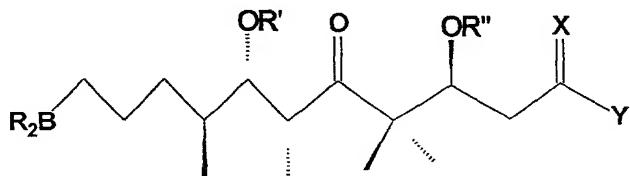
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4

wherein R' and R'' are independently hydrogen, a linear or branched alkyl,

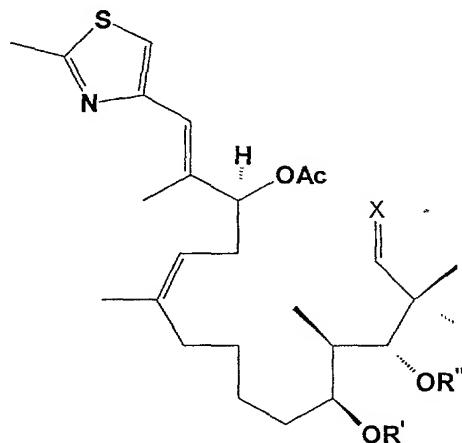
5 substituted or unsubstituted aryl or benzyl, trialkylsilyl, dialkylarylsilyl,
6 alkyldiarylsilyl, a linear or branched acyl, substituted or unsubstituted aroyl or
7 benzoyl; wherein X is oxygen, $(OR^*)_2$, $(SR^*)_2$, $-(O-(CH_2)_n-O)-$, $-(O-(CH_2)_n-S)-$ or $-(S-$
8 $(CH_2)_n-S)-$; wherein R^* is a linear or branched alkyl, substituted or unsubstituted aryl
9 or benzyl; wherein R_2B is a linear, branched or cyclic alkyl or substituted or
10 unsubstituted aryl or benzyl boranyl moiety; and wherein n is 2, 3 or 4.

1 10. A compound having the structure:



3 wherein R' and R'' are independently hydrogen, a linear or branched alkyl,
4 substituted or unsubstituted aryl or benzyl, trialkylsilyl, dialkylarylsilyl,
5 alkyldiarylsilyl, a linear or branched acyl, substituted or unsubstituted aroyl or
6 benzoyl; wherein X is oxygen, $(OR^*)_2$, $(SR^*)_2$, $-(O-(CH_2)_n-O)-$, $-(O-(CH_2)_n-S)-$ or $-(S-$
7 $(CH_2)_n-S)-$; wherein R^* is a linear or branched alkyl, substituted or unsubstituted aryl
8 or benzyl; wherein R_2B is a linear, branched or cyclic alkyl or substituted or
9 unsubstituted aryl or benzyl boranyl moiety; wherein Y is OH, linear or branched
10 chain alkoxy, trimethylsilyloxy, t-butyldimethylsilyloxy or methyldiphenylsilyloxy; and
11 wherein n is 2, 3 or 4.
12

1 11. A compound having the structure:



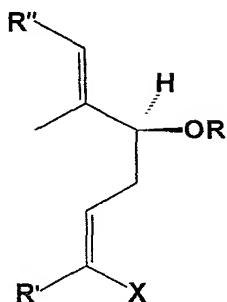
3 wherein R' and R'' are independently hydrogen, a linear or branched alkyl,
4 substituted or unsubstituted aryl or benzyl, trialkylsilyl, dialkylarylsilyl,
5 alkyldiarylsilyl, a linear or branched acyl, substituted or unsubstituted aroyl or
6 benzoyl; wherein X is oxygen, $(OR^*)_2$, $(SR^*)_2$, $-(O-(CH_2)_n-O)-$, $-(O-(CH_2)_n-S)-$ or $-(S-$
7 $(CH_2)_n-S)-$

8 (CH₂)_n-S)-; and wherein n is 2, 3 or 4.

1 12. The compound of claim 11 wherein R' is TBS, R'' is TPS and X is (OMe)₂.

1 13. A compound having the structure:

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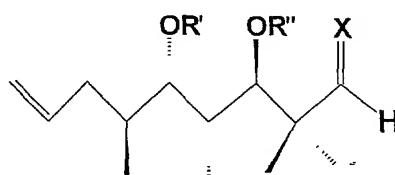


3
4 wherein R is hydrogen, a linear or branched alkyl, alkoxyalkyl, substituted or
5 unsubstituted aryloxyalkyl, linear or branched acyl, substituted or unsubstituted aroyl
6 or benzoyl; wherein X is a halogen; wherein R'' is H, linear or branched chain alkyl,
7 phenyl, 2-methyl-1,3-thiazolinyl, 2-furanyl, 3-furanyl, 4-furanyl, 2-pyridyl, 3-pyridyl,
8 4-pyridyl, imidazolyl, 2-methyl-1,3-oxazolinyl, 3-indolyl or 6-indolyl; and wherein Y
9 is H or linear or branched chain alkyl.; wherein R' is H, linear or branched chain
10 alkyl, hydroxymethyl, hydroxypropyl, alkyl carboxaldehyde, alkyl carboxaldehyde
11 linear or cyclic acetal; and X is a halide.

1 14. The compound of claim 13 wherein R is acetyl and X is iodo.

1 15. A compound having the structure:

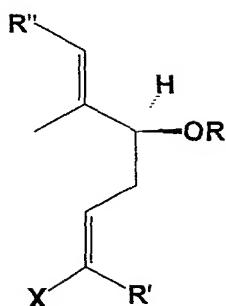
2



3
4 wherein R' and R'' are independently hydrogen, a linear or branched alkyl,
5 substituted or unsubstituted aryl or benzyl, trialkylsilyl, dialkylarylsilyl,
6 alkyldiarylsilyl, a linear or branched acyl, substituted or unsubstituted aroyl or
7 benzoyl; wherein X is oxygen, (OR)₂, (SR)₂, -(O-(CH₂)_n-O)-, -(O-(CH₂)_n-S)- or -(S-
8 (CH₂)_n-S)-; and wherein n is 2, 3 or 4.

1 16. A compound having the structure:

2



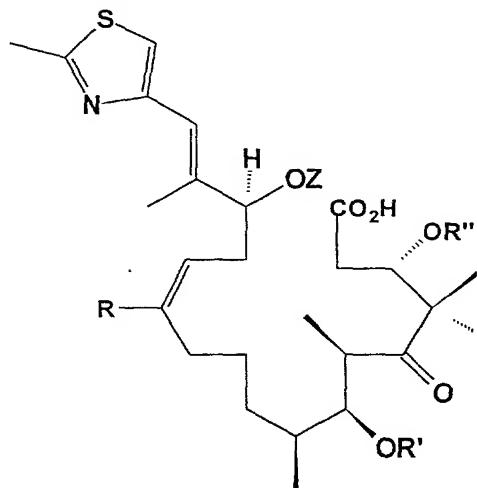
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wherein R is hydrogen, a linear or branched alkyl, alkoxyalkyl, substituted or unsubstituted aryloxyalkyl, linear or branched acyl, substituted or unsubstituted aroyl or benzoyl; wherein X is a halogen; wherein R' is H, linear or branched chain alkyl, alkyl carboxaldehyde, alkyl carboxaldehyde linear or cyclic acetal; wherein R" is H, linear or branched chain alkyl, phenyl, 2-methyl-1,3-thiazolinyl, 2-furanyl, 3-furanyl, 4-furanyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, imidazolyl, 2-methyl-1,3-oxazolinyl, 3-indolyl or 6-indolyl; and wherein Y is H or linear or branched chain alkyl.

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17. A compound having the structure:

2



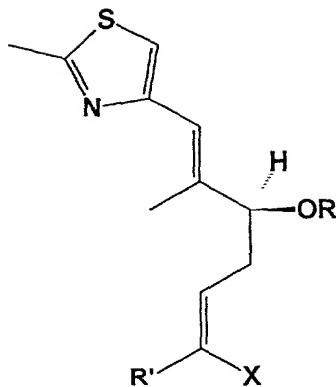
3

wherein R is hydrogen, methyl, ethyl, n-propyl, n-hexyl, CO_2Et , , CH_2OH ; or $(\text{CH}_2)_3\text{-OH}$; wherein R' and R'' are independently hydrogen, a linear or branched alkyl, substituted or unsubstituted aryl or benzyl, trialkylsilyl, dialkylarylsilyl, alkyldiarylsilyl, a linear or branched acyl, substituted or unsubstituted aroyl or benzoyl; and wherein Z is hydrogen, or linear or branched chain alkyl.

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18. A method of preparing a Z-haloalkene ester having the structure:

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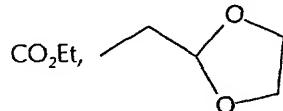
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wherein R is hydrogen, a linear or branched alkyl, alkoxyalkyl, substituted or unsubstituted aryloxyalkyl, linear or branched acyl, substituted or unsubstituted aroyl or benzoyl; wherein R' is hydrogen, methyl, ethyl, n-propyl, n-hexyl,

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, CH₂OH or (CH₂)₃-OH; and wherein X is a halogen,

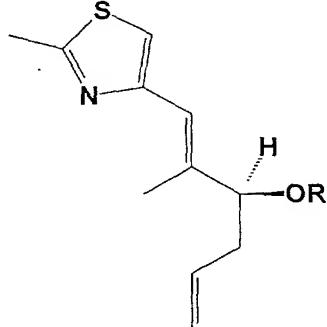
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which comprises

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(a) oxidatively cleaving a compound having the structure:

10



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under suitable conditions to form an aldehyde intermediate; and

13

(b) condensing the aldehyde intermediate with a halomethylene transfer agent under suitable conditions to form the Z-haloalkene ester.

1

19. The method of claim 18 wherein X is iodine.

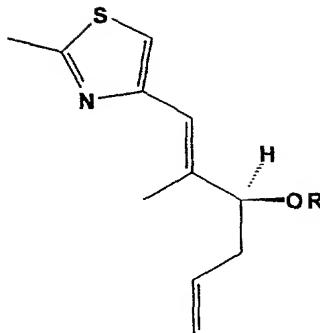
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20. The method of claim 18 wherein the halomethylene transfer agent is Ph₃P=CR'I or (Ph₃P⁺CHR'I)⁻

1

21. A method of preparing an optically pure compound having the structure:

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4 wherein R is hydrogen, a linear or branched alkyl, alkoxyalkyl, substituted or
5 unsubstituted aryloxyalkyl, linear or branched acyl, substituted or unsubstituted aroyl
6 or benzoyl, which comprises:

7 (a) condensing an allylic organometallic reagent with an unsaturated
8 aldehyde having the structure:

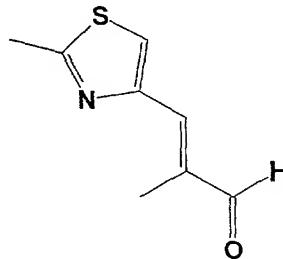
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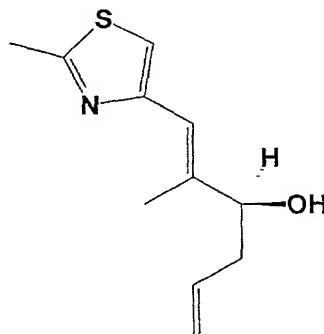
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under suitable conditions to form an alcohol, and, optionally
concurrently therewith, optically resolving the alcohol to form an
optically pure alcohol having the structure:

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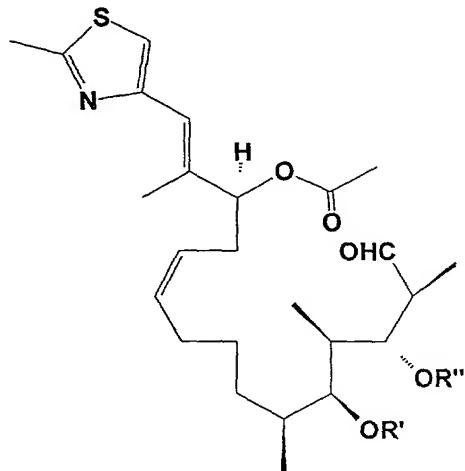
(b) alkylating or acylating the optically pure alcohol formed in step (a)
under suitable conditions to form the optically pure compound.

1 22. The method of claim 21 wherein the allylic organometallic reagent is an
2 allyl(trialkyl)stannane.

1 23. The method of claim 21 wherein the condensing step is effected using a reagent
2 comprising a titanium tetraalkoxide and an optically active catalyst.

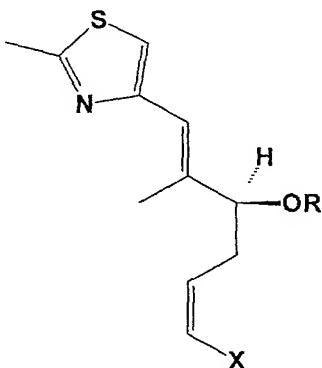
1 24. The method of claim 23 wherein the optically active catalyst is
2 S(-)BINOL.

1 25. A method of preparing an open-chain aldehyde having the structure:



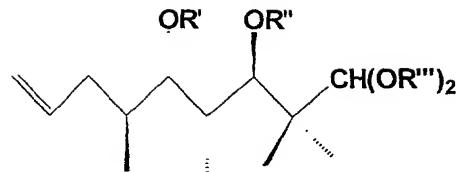
wherein R' and R'' are independently hydrogen, a linear or branched alkyl, substituted or unsubstituted aryl or benzyl, trialkylsilyl, dialkylarylsilyl, alkyldiarylsilyl, a linear or branched acyl, substituted or unsubstituted aroyl or benzoyl, which comprises:

(a) cross-coupling a haloolefin having the structure:



wherein R is a linear or branched alkyl, alkoxyalkyl, substituted or unsubstituted aryloxyalkyl, trialkylsilyl, aryldialkylsilyl, diarylalkylsilyl, triarylsilyl, linear or branched acyl, substituted or unsubstituted aroyl or benzoyl, and X is a halogen, with a terminal olefin having the structure:

15

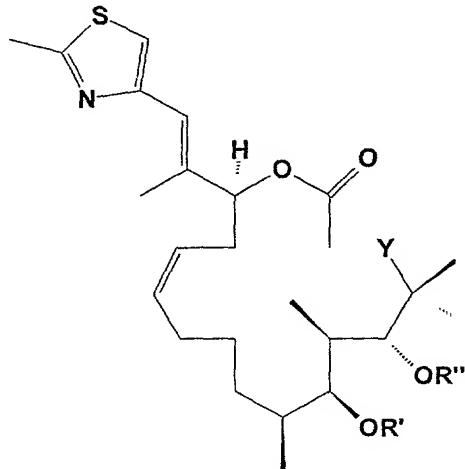


16

17 wherein $(OR'')_2$ is $(OR_0)_2$, $(SR_0)_2$, $-(O-(CH_2)_n-O)-$, $-(O-(CH_2)_n-S)-$ or $-(S-(CH_2)_n-S)-$ where R_0 is a linear or branched alkyl, substituted or
18 unsubstituted aryl or benzyl; and wherein n is 2, 3 or 4, under suitable
19 conditions to form a cross-coupled compound having the structure:

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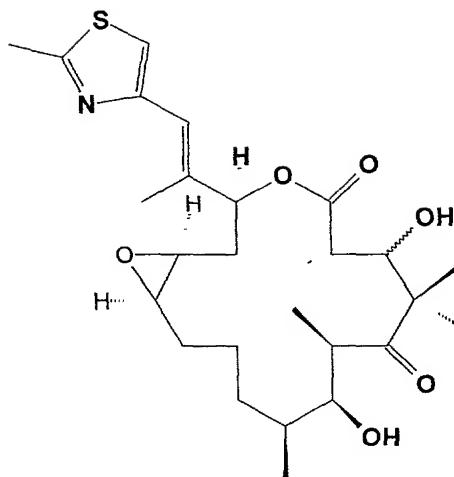
wherein Y is $CH(OR^*)_2$ where R^* is a linear or branched alkyl,

alkoxyalkyl, substituted or unsubstituted aryloxyalkyl; and

(b) deprotecting the cross-coupled compound formed in step (a) under suitable conditions to form the open-chain compound.

1 26. A method of preparing an epothilone having the structure:

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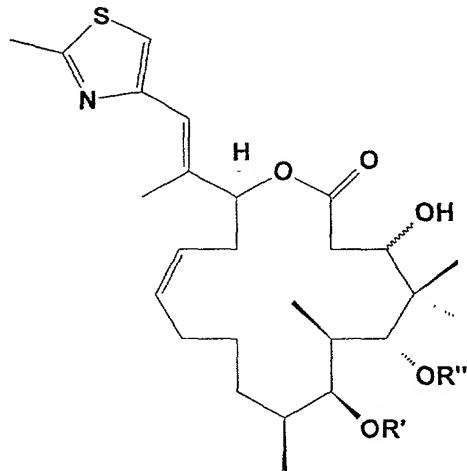
which comprises:

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(a) deprotecting a cyclized compound having the structure:

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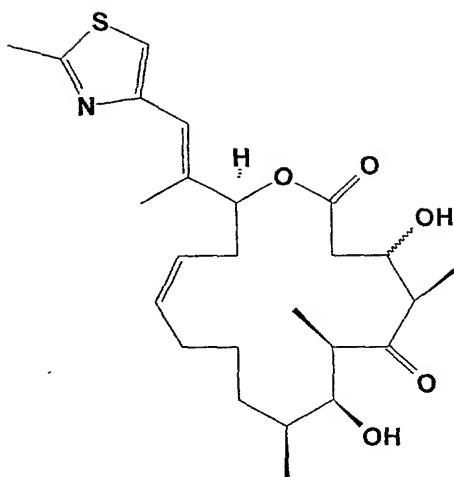
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10 wherein R' and R'' are independently hydrogen, a linear or branched
11 alkyl, substituted or unsubstituted aryl or benzyl, trialkylsilyl,
12 dialkylarylsilyl, alkyldiarylsilyl, a linear or branched acyl, substituted or
13 unsubstituted aroyl or benzoyl, under suitable conditions to form a
14 deprotected cyclized compound and oxidizing the deprotected cyclized
15 compound under suitable conditions to form a desoxyepothilone having
the structure:

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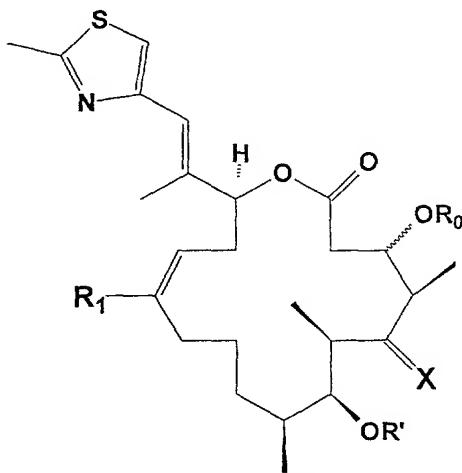
and

(b) epoxidizing the desoxyepothilone formed in step (a) under suitable conditions to form the epothilone.

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27. A method of preparing an epothilone precursor having the structure:

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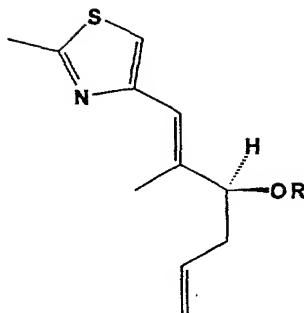
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wherein R_1 is hydrogen or methyl; wherein X is O, or a hydrogen and OR'' , each singly bonded to carbon; and wherein R_0 , R' and R'' are independently hydrogen, a linear or branched alkyl, substituted or unsubstituted aryl or benzyl, trialkylsilyl, dialkylarylsilyl, alkyldiarylsilyl, a linear or branched acyl, substituted or unsubstituted aroyl or benzoyl, which comprises

(a) coupling a compound having the structure:

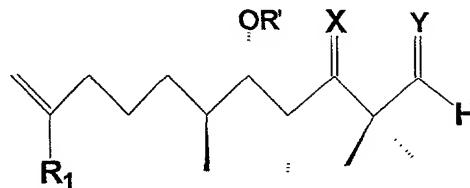
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13 wherein R is an acetyl, with an aldehyde having the structure:

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21 wherein Y is oxygen, under suitable conditions to form an aldol intermediate
22 and optionally protecting the aldol intermediate under suitable conditions to
23 form an acyclic epothilone precursor having the structure:

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(b) subjecting the acyclic epothilone precursor to conditions leading to
intramolecular olefin metathesis to form the epothilone precursor.

1 28. The method of claim 27 wherein the conditions leading to intramolecular olefin
2 metathesis require the presence of an organometallic catalyst.

1 29. The method of claim 27 wherein the catalyst is a Ru or Mo complex.

1 30. A pharmaceutical composition for treating cancer comprising a compound of claim 1,

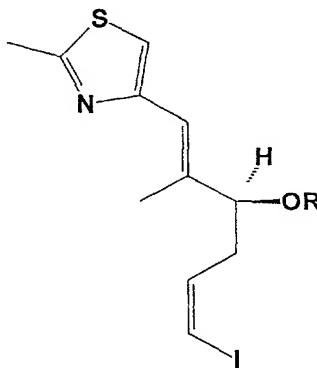
2 3, 5, 7, or 8 and a pharmaceutically suitable carrier.

1 31. A method of treating cancer in a subject suffering therefrom comprising administering
2 to the subject a therapeutically effective amount of a compound of claim 1, 3, 5, 7 or
3 8 and a pharmaceutically suitable carrier.

1 32. The method of claim 31 wherein the cancer is a solid tumor.

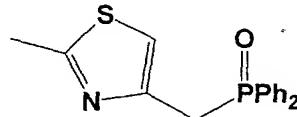
1 33. The method of claim 31 wherein the cancer is breast cancer.

1 34. A method of preparing a Z-iodoalkene ester having the structure:

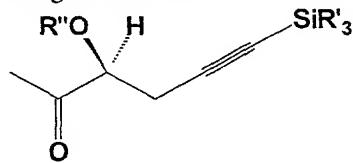


14 wherein R is hydrogen, a linear or branched alkyl, alkoxyalkyl, substituted or
15 unsubstituted aryloxyalkyl, linear or branched acyl, substituted or unsubstituted aroyl
16 or benzoyl, which comprises

17 (a) coupling a compound having the structure:

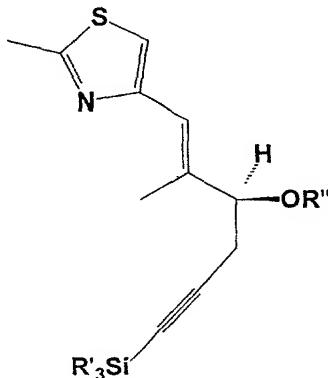


22 with a methyl ketone having the structure:

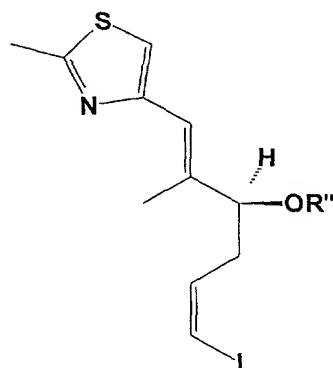


27 wherein R' and R'' are independently a linear or branched alkyl,

28 alkoxyalkyl, substituted or unsubstituted aryl or benzyl, under suitable
29 conditions to form a compound having the structure:

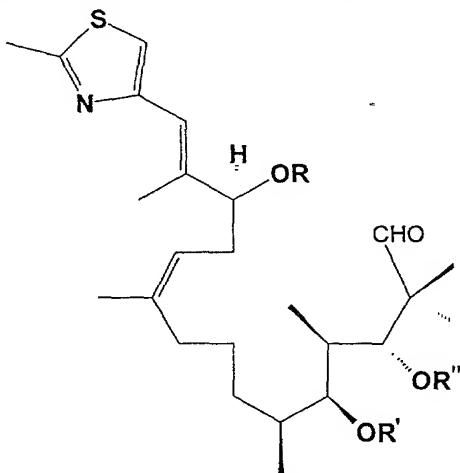


(b) treating the compound formed in step (a) under suitable conditions to form a Z-iodoalkene having the structure:



and

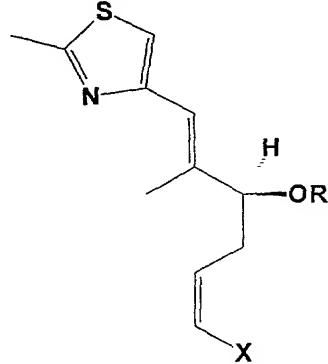
(c) deprotecting and acylating the Z-iodoalkene formed in step (b) under suitable conditions to form the Z-iodoalkene ester.



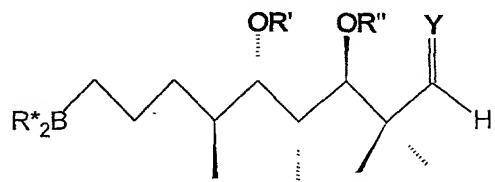
wherein R is a linear or branched alkyl, alkoxyalkyl, substituted or unsubstituted

5 aryloxyalkyl, trialkylsilyl, arylalkylsilyl, diarylalkylsilyl, triarylsilyl, linear or
6 branched acyl, substituted or unsubstituted aroyl or benzoyl; and wherein R' and
7 R'' are independently hydrogen, a linear or branched alkyl, substituted or
8 unsubstituted aryl or benzyl, trialkylsilyl, dialkylarylsilyl, alkyldiarylsilyl, a linear or
9 branched acyl, substituted or unsubstituted aroyl or benzoyl, which comprises:

10 (a) cross-coupling a haloolefin having the structure:
11

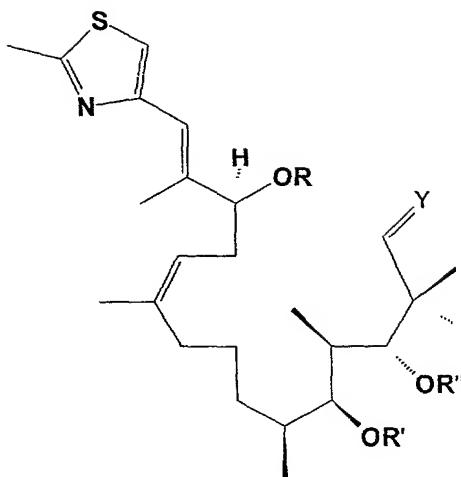


12
13 wherein X is a halogen, with a terminal hydroborane having the structure:
14



15 wherein R^*2B is a linear, branched or cyclic alkyl or substituted or
16 unsubstituted aryl or benzyl boranyl moiety; wherein Y is $(OR_0)_2$, $(SR_0)_2$, ~
17 $(O-(CH_2)_n-O)$, ~ $(O-(CH_2)_n-S)$ or ~ $(S-(CH_2)_n-S)$ where R_0 is a linear or
18 branched alkyl, substituted or unsubstituted aryl or benzyl; and wherein n
19 is 2, 3 or 4, under suitable conditions to form a cross-coupled compound
20 having the structure:
21
22

23



24

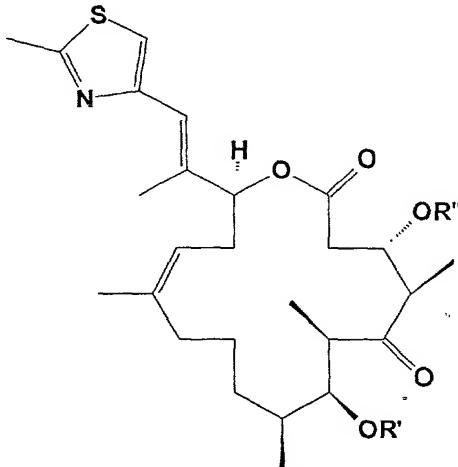
and

25 (b) deprotecting the cross-coupled compound formed in step (a) under
26 suitable conditions to form the open-chain aldehyde.
27

1 36. The method of claim 35 wherein R is acetyl; R' is TBS; R'' is TPS; R*₂B is derived
2 from 9-BBN; and Y is (OMe)₂.

1 37. A method of preparing a protected epothilone having the structure:

2

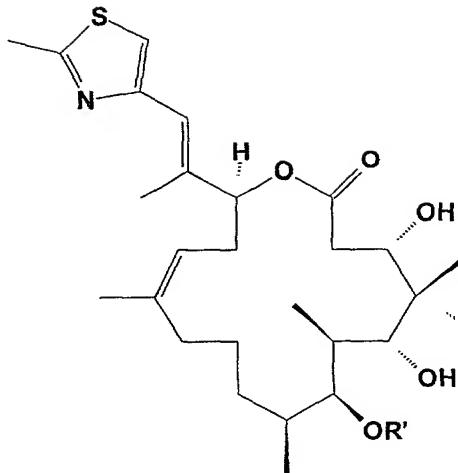


3

4 wherein R' and R'' are independently hydrogen, a linear or branched alkyl,
5 substituted or unsubstituted aryl or benzyl, trialkylsilyl, dialkyl-arylsilyl,
6 alkyldiarylsilyl, a linear or branched acyl, substituted or unsubstituted aroyl or
7 benzoyl, which comprises:

8 (a) monoprotecting a cyclic diol having the structure:

9



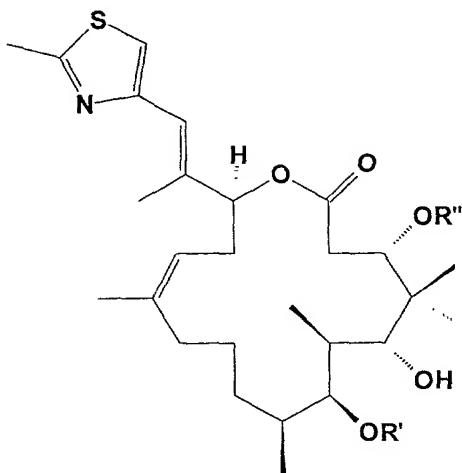
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12

13

under suitable conditions to form a cyclic alcohol having the structure:



14

15

and

16

(b) oxidizing the cyclic alcohol formed in step (a) under suitable conditions to form the protected epothilone.

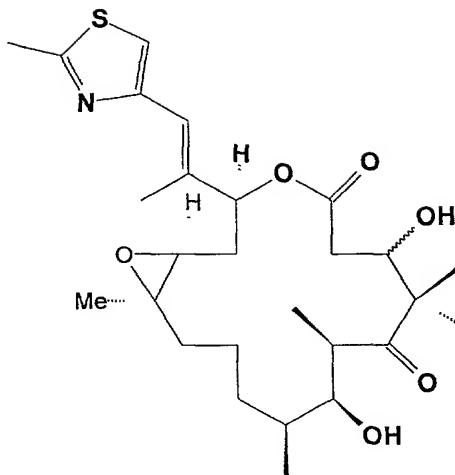
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38. The method of claim 37 wherein R' and R'' are TBS.

1

39. A method of preparing an epothilone having the structure:

2



3

which comprises:

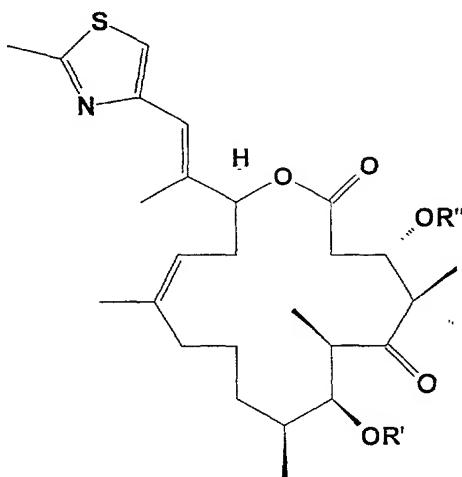
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(a) deprotecting a protected cyclic ketone having the structure:

5

6

7



8

9

10

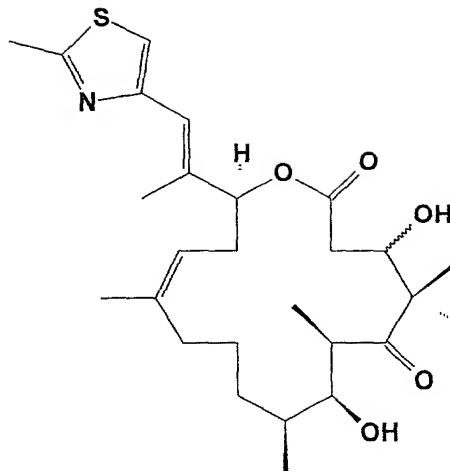
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12

13

wherein R' and R'' are independently hydrogen, a linear or branched alkyl, substituted or unsubstituted aryl or benzyl, trialkylsilyl, dialkylarylsilyl, alkyldiarylsilyl, a linear or branched acyl, substituted or unsubstituted aroyl or benzoyl, under suitable conditions to form a desoxyepothilone having the structure:

14



15

and

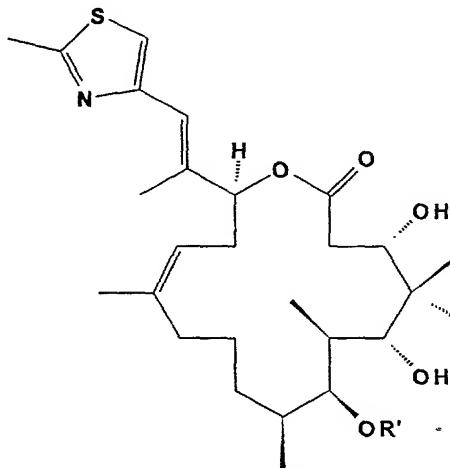
16

17 (b) epoxidizing the desoxyepothilone formed in step (a) under suitable
18 conditions to form the epothilone.

1 40. The method of claim 39 wherein R' and R'' are TBS.

1 41. A method of preparing a cyclic diol having the structure:

2



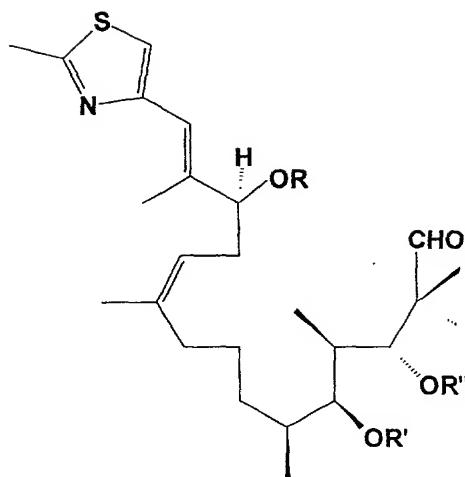
3

4 wherein R' is a hydrogen, a linear or branched alkyl, substituted or unsubstituted aryl
5 or benzyl, trialkylsilyl, dialkylarylsilyl, alkyldiarylsilyl, a linear or branched acyl,
6 substituted or unsubstituted aroyl or benzoyl, which comprises:

7

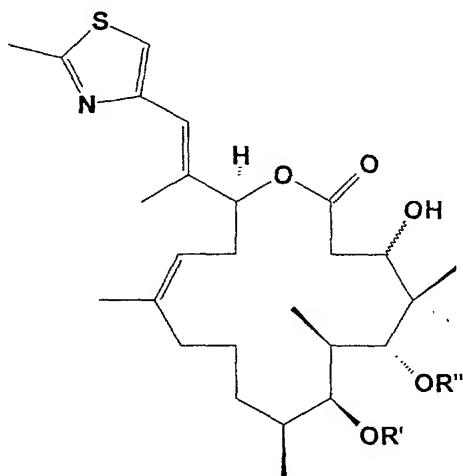
(a) cyclizing an open-chain aldehyde having the structure:

8



9

10 wherein R is a linear or branched alkyl, alkoxyalkyl, substituted or
11 unsubstituted aryloxyalkyl, trialkylsilyl, aryldialkylsilyl, diarylalkylsilyl,
12 triarylsilyl, linear or branched acyl, substituted or unsubstituted aroyl or
13 benzoyl; and wherein R' is a hydrogen, a linear or branched alkyl,
14 substituted or unsubstituted aryl or benzyl, trialkylsilyl, dialkylarylsilyl,
15 alkyldiarylsilyl, a linear or branched acyl, substituted or unsubstituted aroyl
16 or benzoyl under suitable conditions to form an enantiomeric mixture of a
17 protected cyclic alcohol having the structure:
18



19

20 said mixture comprising an α - and a β -alcohol component;

21 (b) optionally isolating and oxidizing the α -alcohol formed in step (a) under
22 suitable conditions to form a ketone and thereafter reducing the ketone
23 under suitable conditions to form an enantiomeric mixture of the protected
24 cyclic alcohol comprising substantially the β -alcohol; and
25 (c) treating the protected cyclic alcohol formed in step (a) or (b) with a
26 deprotecting agent under suitable conditions to form the cyclic diol.

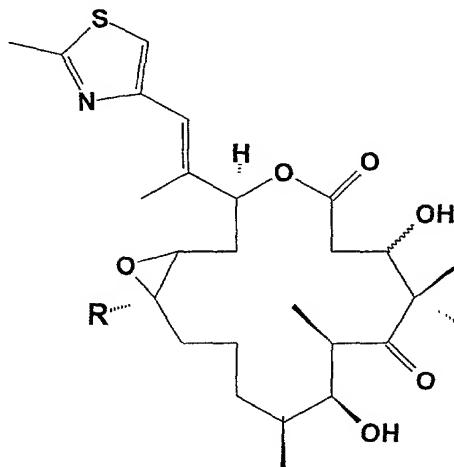
1 42. The method of claim 41 wherein R' is TBS and R'' is TPS.

1 43. A purified compound having the structure:

2

3

4



5

6

7

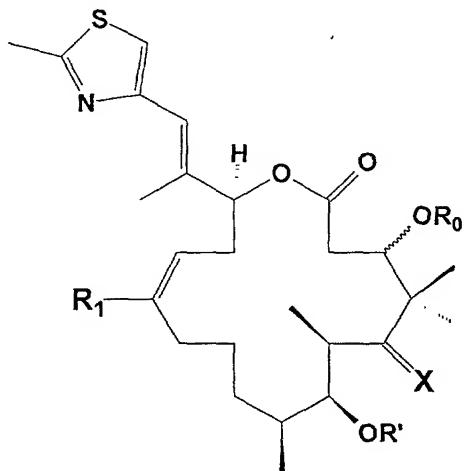
8

wherein R is hydrogen, methyl, ethyl, propyl, hexyl, hydroxymethyl or hydroxypropyl; wherein X is O; and wherein R₀, R' and R'' are independently hydrogen or acetyl.

1

44. A purified compound having the structure:

2



3

4

5

6

wherein R₁ is hydrogen, methyl, ethyl, propyl, hexyl, hydroxymethyl or hydroxypropyl; wherein X is O; and wherein R₀, R' and R'' are independently hydrogen or acetyl.

53

1 45. A composition comprising an amount of the compound of claim 1, 2, 3, 4, 5, 6, 7, 8,
2 43 or 44 effective to inhibit the growth of multidrug resistant cells and a

3 pharmaceutically acceptable carrier.

1 46. The composition of claim 45, further comprising an amount of a cytotoxic agent.

1 47. The composition of claim 46, wherein the cytotoxic agent is an anticancer agent.

1 48. The composition of claim 47, wherein the anticancer agent is adriamycin.

1 49. The composition of claim 47, wherein the anticancer agent is vinblastin.

1 50. The composition of claim 47, wherein the anticancer agent is paclitaxel.

1 51. The composition of claim 45, wherein the effective amount of the compound is
2 between about 0.01 mg/kg to about 25 mg/kg of body weight.

1 52. A method of inhibiting the growth of multidrug resistant cells comprising contacting
2 the multidrug resistant cells with an amount of the compound of claim 1, 2, 3, 4, 5,
3 6, 7, 8, 43 or 44 effective to inhibit the growth of multidrug resistant cells in
4 combination with a pharmaceutically acceptable carrier.

1 53. The method of claim 52, further comprising administering an amount of a cytotoxic
2 agent.

1 54. The method of claim 53, wherein the cytotoxic agent is an anticancer agent.

1 55. The method of claim 54, wherein the anticancer agent is adriamycin.

1 56. The method of claim 55, wherein the anticancer agent is vinblastin.

1 57. The method of claim 55, wherein the anticancer agent is paclitaxel.

1 58. The method of claim 55, wherein the effective amount of the compound is between
2 about 0.01 mg/kg to about 25 mg/kg of body weight.